

What is claimed is:

1. An underwater laser processing apparatus, comprising:  
an optical unit that irradiates a condensed laser beam generated by a laser source to a certain point of an underwater workpiece; and  
a nozzle having a gas exit for supplying gas to the certain point,  
wherein the nozzle comprises an area surrounding the gas exit extending to the surface of the workpiece for keeping the supplied gas between the nozzle and the workpiece.
2. The apparatus according to claim 1, wherein a nozzle is formed as a disk having the gas exit at the center thereof.
3. The apparatus according to claim 2, wherein a diameter of the nozzle exceeds the diameter of the exit by more than approximately 1.5 mm.
4. The apparatus according to claim 2, wherein the nozzle has a circular groove on the surface facing the workpiece.
5. The apparatus according to claim 1, further comprising a welding wire exit that supplies a welding wire to the certain point.
6. The apparatus according to claim 5, wherein the welding wire exit is a wire tip disposed in the nozzle.
7. The apparatus according to claim 1, wherein the optical unit irradiates the laser beam at an angle to the workpiece.
8. The apparatus according to claim 1, further comprising a bush that prevents a reflected laser beam from entering the laser source.
9. The apparatus according to claim 1, wherein the optical unit comprises a collimator lens that makes parallel the laser beam from the laser source, and a condenser lens that condenses the parallel laser beam.
10. The apparatus according to claim 9, further comprising a dichroic mirror that separates visible light from the laser beam and inputs

the separated visible light to an image sensor.

11. The apparatus according to claim 1, further comprising an adjuster that adjusts a gap between the nozzle and the workpiece.

12. The apparatus according to claim 11, wherein the adjuster comprises a roller that rolls on the workpiece.

Sub A1  
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13. An underwater laser processing method, comprising:  
irradiating a condensed laser beam generated by a laser source to a certain point of an underwater workpiece; and  
supplying gas to the certain point from a nozzle having a gas exit, the nozzle having an area surrounding the gas exit that extends to the surface of the workpiece for keeping the supplied gas between the nozzle and the workpiece.

14. The method according to claim 13, wherein the nozzle is formed as a disk having the gas exit at the center thereof.

15. The method according to claim 13, wherein the nozzle has a circular groove on the surface facing the workpiece.

16. The method according to claim 13, further comprising supplying a welding wire to the certain point.

17. The method according to claim 13, wherein the irradiating step irradiates the laser beam at an angle to the workpiece.

18. The method according to claim 13, further comprising separating visible light by a dichroic mirror, and inputting the separated visible light to an image sensor.

Sub A2  
19. The method according to claim 13, further comprising adjusting a gap between the nozzle and the workpiece.

20. An underwater laser processing apparatus, comprising:  
means for irradiating a condensed laser beam generated by a laser

[illegible]